600-76-0145

orig

THE EFFECT OF MEDICARE CARRIER PRACTICES ON PHYSICIAN FEES:

A NATIONAL STUDY

Charlotte F. Muller, Ph.D., Jonah Otelsberg, Ph.D., and Nina Pascal, M.Phil.

Center for Social Research
Graduate School
City University of New York
33 West 42 Street
New York, New York 10036

Supported by DHEW/Health Care Financing Administration Contract #600-76-0145.

American Public Health Association 107th Annual Meeting, 2 P.M., Wednesday, November 7, 1979, Medical Care Section, Health Services Financing Session.

THE EFFECT OF MEDICARE CARRIER PRACTICES ON PHYSICIAN FEES:

A NATIONAL STUDY

Abstract

In setting reasonable charges for physician services under Part B of Medicare, carriers that administer claims payment have wide discretion at numerous points and this can affect Medicare fees. These effects were studied for the Health Care Financing Administration (HCFA) using nationwide data. Using Medicare fee data supplied by HCFA fee indices at both the 50th and 75th percentile levels were developed for GPs, specialists, and both groups combined. Also, Supplementary Medical Insurance (SMI) expenditure per enrollee was used as a measure of Medicare program cost.

Factor analysis and multiple stepwise regression techniques were used in the study, and were applied to a wide variety of variables coming under three broad headings: carrier discretionary practices, carrier administrative performance, and socioeconomic forces. The analysis was performed for Blue Shield and all other (chiefly commercial) carriers separately as well as together. The results showed that between 63 and 75% of the variance in fee indices for all carriers was explained by the factors represented. The explanation was somewhat better for non-Blue carriers than for the Blues. The burden of the explanation was carried by health economy variables, notably percent urban (of the population), interpreted as a demand/supply interaction factor. But some effect was produced by discretionary practices of carriers, namely, those concerning pricing methods in absence of conditions required for the reasonable charge process. Physician fees also responded to rates of claims investigation, bill reduction and processing time.

The regulatory implication of the study is that achieving more uniform fees would be quite difficult. This sets limits on the future of a payment system based on reasonable charge determination.

Introduction

The analysis of the effect of carrier practices on the determination of physician fees under Medicare that is reported in this paper is addressed to assessment of the implications of the present mode of administration. Part B is administered by numerous carriers which are either nonprofit organizations (Blue Shield or Group Health, Incorporated (GHI)), or commercial insurance companies (single-state or multi-state firms).[1/] A uniform approach to pricing is a prerequisite to achieving a uniform benefit to enrollees living in different parts of the country, equitable treatment of practitioners under the program, and guaranteeing to the aged access to services that they need.

Previous research has indicated important facts about the fee structure under Medicare. A study by the Institute of Medicine[2/] revealed the significance of certain socioeconomic factors in explaining why the same procedure cost different - sometimes vastly different - amounts in different counties. In the study, prevailing fees before and after adjustment for the cost of living were used as variables in equations testing the influence of fees on physician density, and the influence of physician supply on fees. The factors which influenced supply of doctors (density by area) included medical schools, per capita income, region, and SMSA[3/] population (which had a negative effect, possibly owing to poverty of inner-city residents). Medicare fees were found to have a positive influence on supply, but private insurance fees did not. Both adjusted and unadjusted fees were significantly affected by such factors as income, MD density, and SMSA population. The IOM study does show an interrelationship between fees and physician supply, and an effect of socioeconomic factors on these variables. The principal finding is that the reasonable charge process does not bring about a "rational" distribution of physicians across localities and is unlikely to do so.

Schieber et al.[4/] explored the fees charged by specialists and general practitioners for the same listed procedure. Thirty-nine medical procedures frequently performed under Medicare were examined using data from 47 carriers. Fiscal year 1975 prevailing charges, based on calendar year 1973 billings, were examined to determine general practitioner/specialist differences and inter-locality variation. It was found that GP/specialist differences were common but for a number of laboratory procedures it was the GP whose fees were higher. The relatively high levels of GP fees for laboratory work (in contrast to other professional activities for which specialist fees are higher compared to those of GPs) may indicate one way in which physicians respond to competition, that is, GPs may have to charge less than specialists for office visits in order to retain a clientele but may reduce the income gap between themselves and specialists by charging as much or more for diagnostic tests. The study by Schieber et al. provides an indicator of the effect of carrier practices interacting with local market characteristics: the fact that fees are concentrated around the mean may imply that the effect of variations in carrier parameters for excluding token and extreme charges and for forming prevailings is subordinated to other factors.

Huang and Koropecky[5/] established that fee schedules and relative value scales used as alternatives to the reasonable charge process under Medicare tended to check the rate of fee inflation and that less frequent fee updating has a similar effect. The study also showed that type of carrier made a difference in fees. Their analysis was confined to carriers whose territories were coterminous with a state.

In all these studies prevailing charges were used as the measure of Medicare fee levels.

CUNY's study was built on the previous work but was able to incorporate new data sources and its method included certain new elements. Both prevailing and 50th percentile fees were used as measures of fees. The latter is, of course, a more accurate measure of central tendency. Our analysis shows that, by and large, factors that influence one measure are also significant for the other.

Conceptual Framework

In approaching the study of how fees were affected by carrier practices, a wide variety of variables in three broad categories were considered. These are: carrier discretionary practices, carrier administrative performance, and socioeconomic forces. The discretionary practices of carriers that were the original focus of the study were concerned with reasonable charge determination.6/ A process of many stages, this task contains many opportunities for different interpretations of the basic regulations. These practices were identified by analyzing a questionnaire sent by the Health Care Financing Administration (HCFA) to regional offices.7/ Sixteen practices were eventually classified and scaled on a dimension of "toughness" - presumed ability to keep prices down. While some major issues of divergence among carriers were not included in the source questionnaire, it did provide empirical data not previously available for study. Among the possibly significant practices were those concerning claims data merger or comparison, teaching-setting claims, and pricing methods used in the absence of usual information needed for the reasonable charge process (RCP).

In addition to these practices, the whole claims processing activity can also be viewed as a form of carrier behavior. A statistical source that reported on carrier workload and processing time made it possible to develop certain rates and measures that reflect both direction and efficiency of administrative activity. Speed in processing and extent of claims investigation, denial and reduction - all taken or derived from this source - were viewed as carrier attributes. They contained noticeable variance. Most carrier performance attributes could be shown separately for assigned and unassigned claims. Assignment occurs when a patient transfers his/her right to reimbursement from Medicare to a provider who accepts the reasonable charge as full payment for a service.

The general reasoning behind the study is that what carriers do in setting reasonable charge levels is imposed on already existing market forces. These result in numerous price determinations expressed in submitted charges for individual encounters and services under Medicare. Carriers, by the rules they adopt for choosing the claims to be considered in the computation of prevailings, the specialty groupings they use, the method of arriving at allowed charges for new doctors in an area, and their way of dealing with other circumstances not conforming to the reasonable charge process, can in theory modify the exact values for 50th percentile and prevailing fees that emerge from the distribution of fees in a given market. Whether such effects are substantial, and which of the practices have this power, would be disclosed by the empirical study. For the group of variables related to controlling the admission of specific claims for payment and the size of allowed charges in specific instances of service, the reason for a theoretical effect on fees is clearly dependent on doctors' responses. Claims investigation, denial and reduction activities are perceived in the medical community - by the practitioners directly involved and by others. Aggressive questioning of claims could lead to voluntarily reducing one's submitted charges (on assigned claims) in order to avoid these attentions, but denial or reduction by the carrier might lead to compensatory increases in submitted charges. The length of waiting time for payment could also be seen as a reason to charge more as an offset, although the usual tendency for a seller to associate delay with risk of non-payment may be less common in view of the established history of Medicare.[8/]

These workload variables were believed to be not completely independent of local market factors. For instance, more claims might be investigated when the pressure of demand was motivating physicians to draw more revenue from given services or from given Medicare patients by redescribing services or performing services on scanty justification. Similar interdependence might be found between practices of carriers in setting reasonable charges and the local market for health care. It was obligatory to allow for the effects of socioeconomic factors on Medicare fees in order to assess the role of the carrier practice and performance differences accurately.

The resources for measuring socioeconomic influences for research of this kind have become very large as a result of the creation and expansion of DHEW's Area Resource File (ARF). Data from this file on population, mortality, economic activity and poverty, health facilities and personnel, and other subjects that were presented at the county level were aggregated for the study to the carrier level, which is appropriate for an examination of fee differences due to carrier practices. This federal data source was supplemented by the American Medical Association's statistics on non-federal physicians who are active in patient care for major specialty groupings, by counties. For socioeconomic forces, the problem was more one of selection than of absent variables, although, despite its riches, the ARF lacks an inventory of health status variables, refined measures of physician supply and other desirable statistics. A first selection from the ARF was based on finding major variables:

- likely to be associated with demand for health services in the general population and among the aged. (The former is important because physician charges to Medicare patients are assumed to have a relation to charges to non-elderly patients.) Such measures as per capita income and aged as a percent of the population were in this group.
- indicative of supply of office-based physician services, with which Part B is involved. Present supply was partitioned into specialty types and adjusted by consideration of variables reflecting professional alternatives to patient care (teaching activities).
- showing other influences related to production and use of MD services and their market prices.

According to the reasoning used, based on the literature, per capita income is favorable to demand and thus to higher charges by physicians through its effect on ability to pay. It is also associated with education, which may be conducive to seeking more care and care of high quality. However, income is also indicative of superior health status and of capacity to produce health and some health services at home. Overall, the positive effects on fees were expected to dominate.

The aged as a percent of the population is a variable that should be favorable to demand because of health needs and entry into Medicare entitlement. However, infirmity reducing access to care, and low income relative to younger population groups act as offsets. Medicare enrollees are required to meet a deductible of $60 per year after which Medicare will pay 80% of the allowed charge for a service. The remaining 20% (or coinsurance) is paid by the enrollee. Demand for different specialties may not be equally affected. While adjustment for income level and health status seems an obvious solution to the mixed theoretical effect, needed data are not available to make the adjustments. High mortality rates for the aged could be indicative of intense need, translated into demand, for care. However, patients at high risk of death after a long illness may have exhausted their ability to pay, and this would have a countervailing effect.

Included in the third group of ARF variables are several hospital-related variables that have the capacity to interact; their net effect on fees is not easy to predict. Hospital activities of physicians reduce the physician supply available for office-based care and this applies an upward force to fees. However, the hospital is also an alternative source of patient care. Hospital expense per bed is indicative of more elaborate facilities (i.e., supply, which in turn reflects a demand for costly services) - but it also has an impact on out-of-pocket costs and ability to pay doctors.

It was evident that many of the available socioeconomic variables were highly intercorrelated and, furthermore, that some had two or more contradictory theoretical effects. The purpose of selecting from this set was not, however, to construct a refined theoretical model, but to assure that when isolating the effect of carrier behavior on fees, substantial control for market forces was provided through inclusion of health economic variables. The ones that were ultimately used were in effect proxies for a set of measures related to demand for and supply of health services, and interpretation of their meaning should take this into consideration.

The extent of interrelations among workload variables as revealed by the zero-order correlation matrix is pertinent to predicting expected effects on fees. One question of interest is whether intercorrelations among the variables result in a packed meaning for variables that do enter the equations. Is denial rate, for example, important by reason of its own economic consequences for the doctor, or is it a proxy, in effect, for investigation and claims reduction?

The zero-order correlations show substantial independence (absence of correlation coefficients equal to or greater than .50) for most workload variables. The exception is that stock of pending claims is correlated with processing time: they are alternative measures of the same events. However, investigation rate, denial rate, and reduction rate each stand alone. This means that carriers with highest investigation rates do not necessarily have highest denial rates. To the question posed above the correct answer evidently is that the measures that prove significant are not proxies for other claims control activities of the same carrier. (This also implies that efficiency in terms of claims control is not a unitary attribute of carriers.)

Also relevant are the distinction drawn by carriers between assigned and unassigned claims in investigation, reduction, and denial, and the corresponding distinction that physicians draw in their responses by way of fee behavior. As shown by zero-order correlations, each of the three rates, measured for assigned claims, tends to move together with the corresponding rate for unassigned claims. However, physicians would have reasons to respond differentially. While it is an inconvenience to be investigated for both types of claims, denial and reduction affect revenue only for assigned claims and therefore it is more likely that the denial or reduction of assigned claims would result in compensatory fee increases.

Dependent Variables

HCFA charge data for 50 selected procedures were available by locality with GPs and specialists separated. Both the 50th percentile of the weighted distribution of customaries and the adjusted prevailing were available as measures of fees.

Actual fees for the calendar year are used as the basis for computing prevailing charges, which are the standard used in pricing submitted charges in a subsequent year in the Medicare reasonable charge process. While data on fees could be presented principally by locality, to examine the influence of discretionary administrative practices, which are carrier-wide, on fee levels, carrier-level measures are necessary.

Each of the fee measures has limitations. Fiftieth percentile or median fees do not reflect extreme values, i.e., peculiarities of a market that confer unusual advantages or disadvantages on certain subgroups of participants. However, the 50th percentile measures central tendency better than another percentile. Combining of GP and specialist fees simplifies inter-carrier comparison but loses carrier differences in GP/specialist ratios. Weighting by actual frequencies allows a variety of factors that could create differences in volume to influence measured prices. Such factors include availability of beds for surgery and in-hospital care of medical conditions, ease of transportation for revisits, and patients' ability to meet copayments. Combining all 50 procedures into any single measure may obscure differences in price behavior of the component procedures. Yet measures at the carrier level were needed in order to evaluate the effect of carrier discretionary practices on fees. For this purpose CUNY developed fee indices for each carrier based on fee data available.

The basic observation used for the indices, the 50th percentile fee (the midpoint of the distribution of weighted customaries), is available at the locality level for each of 50 leading procedures performed under Medicare. Separate "50th" values exist for general practitioners and specialists unless the carrier does not form specialty groupings. These locality values were averaged to form a carrier mean, by procedure, keeping GP and specialist means separate. A national mean was also created for each procedure - once for specialists - and the ratio of the carrier mean to the national mean could then be created.

The ratios to the national values obtained for a carrier were used to derive a mean ratio for all the procedures on which it reports information. The value of this mean ratio, or fee index, is a generalized measure of deviation from the national average price level for Medicare. This carrier mean ratio was developed for GPs and specialists separately and for the pool of the GP and specialist fee ratios to the national means for each procedure, referred to as the combined ratio.

The repetition of all the above steps, modified by weighting the values by the frequency of performance of each procedure by GPs and by specialists separately in each locality, created a weighted fee index.

A similar set of calculations was performed for adjusted prevailing fees, based on the 75th percentile of weighted customaries adjusted by the Economic Index and "no rollback" requirement.

Finally, a dependent variable using the entire set of Medicare physician services was developed by taking SMI expenditure and enrollee figures at the county level and aggregating to localities and then to carriers, the end product being SMI expenditure per enrollee for each carrier.

Each fee measure has a different meaning. The weighted fee index is relevant to an ex post fee concept - the prices actually paid by Medicare and by patients, with prices occurring most often given most weight. In contrast, the unweighted 50th is an ex ante fee concept, indicating the set of signals - the range of practitioners' fees - that is presented to physicians and to patients before the next round of seller and buyer behavior occurs in the market. The unweighted index measures the carrier's level of fees compared to the national average. The borderline between Medicare fee and expenditure measures is an unclear one because the act of weighting fees for procedure mix (frequency of utilization) is not too different from measuring dollars spent per enrollee. Some underlying stability is given to SMI expenditure in different areas by the biological element in the utilization pattern of the aged, which is equivalent to applying a standardized set of quantity weights. This would be consistent with considering the SMI figures as a fee measure, but the variation in level and type of services utilized cannot be controlled for. Ultimately, it is most realistic to view SMI expenditure per enrollee as a measure of program cost which is to be explained by considering the factors used to analyze fees. Unlike the weighted fee index, it encompasses all Part B services and not just the top 50 procedures.

Method of Study

Factor analysis was used to select variables for inclusion in regression analysis from the three sources described above (Area Resource File, Workload and Processing Time File, and Discretionary Practices). In all, 175 independent variables were considered. This figure includes both variables in their original form as extracted from the data source and generated variables. Seventy variables were included in factor analysis and were reduced to 18 factors from which the variables to be included in regression analysis were selected. The variables selected were those with highest factor loadings on the factors extracted from the data. The stepwise regression method was employed to insure that only the variables with the highest explanatory power and significant regression coefficients were included in the final equation. Thirty-eight independent variables were afforded the opportunity to enter the regression equations for the twelve dependent variables. The dependent variables were weighted and unweighted fee indices at both the 50th and 75th percentile levels, developed, using Medicare fee data supplied by HCFA, for GPs, specialists, and both groups combined. Also, Part B Supplementary Medical Insurance (SMI) expenditure per enrollee was used as a measure of Medicare program cost.

Because of the possibility that carrier organization type would affect fees, as shown by Huang and Koropecky in an earlier period, separate regressions were run for "Blue" and "all other" carriers as well as for all carriers combined.10/ This method also made it possible to see if different variables influence fees in the two types of carrier environment.

The independent variables were expressed as ratios to the national mean and the analysis was performed both on these and on the actual values of the variables.

Results of Factor Analysis

The SAS package with varimax rotation was used in factor analysis. The first factor extracted, which explained 22% of the variance in the system, can be interpreted as the interaction between supply and demand for medical services. The variables with highest loadings on this factor are: median family income, percent urban, population per active MD (total, medical, surgical, other)[11/], hospital expenditure per bed[12/], and ratio of number of general hospitals to number of hospitals with diagnostic services.

The second factor extracted explained 12% of the variance in the system; it represents the speed with which carriers process claims. The variables with highest loadings on this factor are mean processing time (all claims, assigned claims, unassigned claims), and average stock of pending claims.

An additional 9% of the total variance was explained by the third factor, which represents the physicians involved in hospital-based programs. Highest loadings are found for: ratio of MDs to interns and residents (general hospitals, all hospitals), ratio of number of hospitals to number of internship and residency programs, and population per hospital-based MD.

The fourth factor, which added 8% to the explanation of the variance, expresses the bill reduction activities of the carriers, measured as the ratio of: (claims reduced) to (claims processed and paid or applied to deductible). (Factor 11, which explained 3%, related to the dollar reduction of bills.) For factor 5[13/], which adds 7% to the explanation of the variance, the variables with highest loadings are discretionary practices dealing with merger or comparison of Medicare and non-Medicare claims in reasonable charge determination.

Discretionary practices are also represented by six other factors. Factor 8 represents the pricing policy in absence of a customary charge; factor 10 represents the minimum number of charges required for computation of customaries; factor 12 represents pricing in absence of a prevailing. Other practices represented are pricing of claims submitted by a "new man in town", the minimum number of customaries needed for computing prevailing charges, and the treatment of token and extreme charges in computation of reasonable charges. All the discretionary practice factors together explain 25% of the total variance of the system.

Factor 6, which explains 6% of the variance, represents the potential and actual use of hospitals. The variables with highest loadings on this factor are: number of available bed-days per person (1970) and inpatient days in general and osteopathic hospitals per person (1970). Factor 7, representing the claims denial rate, explains 6% of the variance, and factor 9, standing for carrier investigation rate, explains 4%. Factor 14, which explains 2% of the variance, represents hospital resource use for long-term care facilities. Another 2% is explained by factor 15, expressing the percent of all MDs who are in general hospitals.

By selecting only variables with high loadings on the factors, the number of variables included in the regression trials was reduced to 38.

Results of Regression Analysis

The method of stepwise regression was used. The first variable is selected by the stepwise program by applying the criterion that it has the highest correlation coefficient with fees on the zero-order matrix, and that the coefficient is significant at .50. Each variable added and retained must not only contribute to the explanation of the variance, but must have a coefficient that is significant at .05. Variables that lose their significance following addition of subsequent variables meeting the stated criterion are deleted. The socioeconomic and program-related variables were expressed in scale-free units such as population per medical specialist, and alternatively as ratios to the national mean for each variable. While regression results were unaffected by this, the latter mode gave a standardized interpretation to the coefficients. Discretionary practice variables were based on a non-parametric score ranging up to 4 at most; both the raw scores and the "ratio to mean" transformation were used in the respective analyses. Only the latter is reported. Fee indices and SMI per enrollee were used as dependent variables.

The regression results (Table 1) showed that for 12 equations analyzing determination of fee indices for all carriers between 63 and 75 percent percent of the variance was explained by the predictors considered. The explanations were somewhat better for non-Blue (Table 3) than for Blue carriers (Table 2). In 10 of 12 equations the Blue R^2 value was lower, most notably in the GP prevailings. (.72 vs. .90).[14/] Residuals showed no pattern for any of the equations.

The most important influence on fees came from the socioeconomic domain. Percent urban, which, as previously indicated, was associated with a health-economy demand/supply interaction factor, came into all 12 equations with a positive sign and explained a substantial share of the total variance (e.g., about 35% in the equation for "combined" MDs unweighted 50th percentile fees.) The variable representing the proportion of MDs in general hospitals entered all 12 all-carrier equations and 10 of the 12 non-Blue equations with a positive effect on fees - but in none of the Blue equations did this variable enter with a significant coefficient. Other socioeconomic variables made single appearances: among the variables for population per physician, those for medical, surgical, and other specialties each entered once. Urban concentration raised fees, as did the diversion of part of the MD supply to hospital-based activities. Concentration of some of hospital bed supply in extended-care beds tended to lower 75th percentile fees in Blue carrier territories. This could be indicative of the association of acute-care bed supply with more demand for physician services. The variable for hospital teaching programs entered the weighted 75th percentile fee equation for all carriers with a sign that showed that presence of such programs had a negative effect on fees when the percent of MDs in hospitals was taken into account. This could be explained by provision of patient care under the teaching programs as an alternative to office-based care.

Mortality of the aged was associated with higher fees in commercial carrier territory according to two equations for 50th percentile fee indices (specialist unweighted and GP weighted), and one equation for prevailings (GP unweighted). This conformed to expectation based on the reasoning that lower health status signifies higher demand. But caution should be used in interpretation owing to the crudeness of this variable as a health status indicator.

The discretionary practices of carriers had a definite but relatively minor impact on fees. The group with any measurable effect related to the pricing of claims of an individual MD who lacks a customary charge for a given procedure (number 16), pricing methods used for claims of an individual physician in the absence of a prevailing fee (number 17), comparison with other fee screens, and handling of pricing situations when there is a new doctor in town (number 19) or an established doctor lacking a customary (number 20). A combined score of non-pricing practices that had shown possible effect in preliminary trials failed to enter with one exception. None of the practices entered the Blue equation for GP 50th percentile. Generally, only one or two practices entered any given equation with a significant coefficient.

The workload variables failed to show an effect on fees for all carriers at the 50th percentile, but did have effects on specialist prevailings for all carriers. In the unweighted equation, the processing time for assigned claims was associated with higher fees,[15/] but that for unassigned claims had the opposite effect. In the weighted equation, frequency of bill reduction on unassigned claims lowered fees. Possibly the physicians reduce their fees to avoid difficulties with and for their patients in Medicare settlement.[16/] Since the rate of bill reduction on assigned claims is closely correlated with the rate for unassigned, a distinction may not be justified even though the reduction variable for the assigned group did not enter. The fee response to shorter processing time does conform with the expectation that physicians will seek compensation for the delay in payment. But the response of doctors to these dimensions of administrative performance is not fully revealed by analysis using aggregative measures. It would be worth looking into by direct inquiry and with attention paid to differences among specialties. Investigation rate did show a fee-lowering effect in the territories of commercial carriers, for prevailing fees within specialist and combined groups. Physicians may well have associated investigation with their fee demands and sought to reduce the inconvenience of an inquiry.

The failure of these variables to appear consistently should be considered a good reason for caution in ascribing influence or drawing policy conclusions. Also, the proportion of the variance explained was limited. This is true for both discretionary practices and workload items. The proportion of variance explained by equations in which SMI expenditure per enrollee was the dependent variable was similar to the results from the fee index equations. For all carriers, R^2 was .77. This was also the value of R^2 in the commercial-carrier equations, but the Blue equation had a slightly lower R^2. For all carriers, percent urban, physicians in general hospitals, and the presence of hospital teaching programs had a positive effect. These influences are similar to those already discussed in relation to fee indices. It is of interest that population per MD, in this context, had a negative effect. While there are possible explanations for this, it should be recalled that related variables in which doctors are classified by specialty (e.g., population per surgical specialist) do have the expected positive effect. Possibly the hospital teaching programs took care of much of the demand represented, and this allowed the low-income population of the inner city to depress fees. Also, patients may have failed to get access to MDs to satisfy potential demand. Lower SMI expense per enrollee was associated with "strict" scores on selected discretionary practices tried as a group, but tough pricing methods for a new MD in a community had a positive effect. Although this was not expected, there may be an association with established doctors having less fear of competition from new entrants. Higher claims denial rates lowered SMI outlay per enrollee in an area, probably an obvious consequence of the pruning action itself. In non-Blue territory, frequency of claims reduction lowered SMI outlay, but the amount of reduction was associated with higher average outlays. Possibly it reflected the high level of submitted charges before reduction.

The fee regression study shows that carrier practices have limited explanatory power. A diversity of practice and performance elements would have to be controlled by Medicare administration to reduce their influence to zero. This involves the difficulty of controlling physician response to fee control. The non-assignment route in particular is available. So are the prescription of revisits and tests, and procedure enhancement. Retention of the reasonable charge process involves great regulatory difficulties in attaining more uniform and moderate fees.

TABLE 1

Regression Equations - All Carriers*

Dependent Variables	R^2	Inter-cept	PCTURB	PCTMDGN	DISPRA 16	DISPRA 17	DISPRA 18	DISPRA 19	DISPRA 20	HOSPRO	AMPTA	POPMED	POPOMD	AMPTU	REDBILU	PCDENPR	DISPRACS
			Independent Variables														
GP77I50	0.7412	0.4685	0.3165 (0.0671)	0.1018 (0.0147)	-0.0733 (0.0303)		0.1029 (0.0288)					0.2283 (0.0580)	-0.1872 (0.0678)				
GP77W50	0.7464	0.4569	0.3414 (0.0707)	0.1080 (0.0319)	-0.0727 (0.0319)		0.1139 (0.0304)					0.2500 (0.0610)	-0.2044 (0.0713)				
GP77IPR	0.6627	0.5370	0.2464 (0.0466)	0.0938 (0.0153)			0.0874 (0.0295)										
GP77WPR	0.6643	0.5370	0.2643 (0.0492)	0.0974 (0.0161)			0.0960 (0.0312)										
SP77I50	0.6286	0.6894	0.3155 (0.0471)	0.0831 (0.0165)					-0.1130 (0.0410)								
SP77W50	0.6397	0.6967	0.3223 (0.0472)	0.0878 (0.0165)					-0.1067 (0.0411)								
SP77IPR	0.7417	0.4856	0.3059 (0.0425)	0.0931 (0.0142)		0.0490 (0.0222)					0.2217 (0.0665)			-0.1713 (0.0686)			
SP77WPR	0.7443	0.8237	0.3187 (0.0423)	0.0857 (0.0150)	-0.0565 (0.0275)						0.0740 (0.0245)				-0.2443 (0.0963)		
C77I50	0.6848	0.4657	0.3639 (0.0498)	0.0909 (0.0153)				0.1147 (0.0486)	-0.0910 (0.0383)	0.0264 (0.0093)							
C77W50	0.6937	0.4601	0.3775 (0.0508)	0.0966 (0.0157)				0.1246 (0.0496)	-0.0865 (0.0391)	0.0274 (0.0095)							
C77IPR	0.6686	0.6378	0.3190 (0.0436)	0.0905 (0.0151)	-0.0662 (0.0286)												
C77WPR	0.7037	0.3790	0.3790 (0.0482)	0.1002 (0.0146)				0.1245 (0.0471)		0.0204 (0.0090)							
SMI75EN	0.7733	0.6893	0.9305 (0.1496)	0.1260 (0.0300)				0.2439 (0.0995)		0.0801 (0.0188)			-0.2717 (0.1338)			-0.3213 (0.0809)	-0.4777 (0.1764)

* Regression equation for $X_j = X_i/\bar{X}$

Where: X_j=ratio of individual carrier value (X_i) to the national mean for the variable ($\bar{X}$)

Standard Deviation (   )

TABLE 2

Regression Equations - Blue Shield Carriers*

Dependent Variables	R^2	Inter-cept	PCTURB	DISPRA 16	DISPRA 20	BEDEC	REDBIL	DISPRA 17	DISPRA 18	DISPRA 19	POPSUR
			Independent Variables								
GP77I50	0.6547	-0.0123	0.3332 (0.0568)				0.6227 (0.2103)				
GP77W50	0.6311	-0.0002	0.3432 (0.0615)				0.6360 (0.2277)				
GP77IPR	0.7213	0.5733	0.3984 (0.0706)	-0.1554 (0.0408)							0.1522 (0.0682)
GP77WPR	0.7242	0.6901	0.3248 (0.0543)	-0.1251 (0.0397)						0.1046 (0.0456)	
SP77I50	0.6070	0.7657	0.3368 (0.0595)		-0.1512 (0.0574)						
SP77W50	0.5853	0.7144	0.3680 (0.0633)	-0.1062 (0.0429)							
SP77IPR	0.7688	0.9955	0.3079 (0.0480)		-0.2563 (0.0519)	0.0146 (0.0054)			-0.0856 (0.0335)		
SP77WPR	0.7513	1.0235	0.3098 (0.0508)		-0.2610 (0.0550)	0.0143 (0.0057)			-0.0937 (0.0355)		
C77I50	0.6409	0.7208	0.3394 (0.0530)	-0.1111 (0.0360)							
C77W50	0.6251	0.7361	0.3518 (0.0565)	-0.1110 (0.0383)							
C77IPR	0.7614	0.7285	0.3160 (0.0442)	-0.1342 (0.0309)		0.0117 (0.0049)		0.0521 (0.0205)			
C77WPR	0.7445	0.7356	0.3262 (0.0467)	-0.1301 (0.0327)		0.0110 (0.0052)		0.0520 (0.0217)			
SMI75EN	0.6933	0.5053	0.7543 (0.1053)		-0.2596 (0.1016)						

* Regression equation for $X_j = X_i/\bar{X}$

Where: X_j=ratio of individual carrier value (X_i) to the national mean for the variable ($\bar{X}$)

Standard Deviation (   )

TABLE 3

Regression Equations-All Other (Non-Blue) Carriers*

Independent Variables

Dependent Variables	R^2	Intercept	PCTURB	PCTMDCN	DISPRA18	DISPRACS	EXPBED	MORTAGED	PCINV	AVSTPDA	AVSTPDU	AMPTA	REDBIL	RED	DISPRA 20
GP77I50	0.7904	0.6740	0.2591 (0.0862)	0.1286 (0.0189)						0.1657 (0.0782)	-0.2477 (0.0796)				
GP77W50	0.7996	-0.3321	0.3911 (0.0855)	0.1019 (0.0235)	0.1988 (0.0638)			0.6528 (0.3147)							
GP77IPR	0.9052	-0.0732	0.3410 (0.0539)	0.0942 (0.0148)	0.2124 (0.0403)			0.4897 (0.1984)							-0.0924 (0.0341)
GP77WPR	0.9032	-0.1323	0.3710 (0.0579)	0.0968 (0.0160)	0.2319 (0.0433)			0.5277 (0.2133)							-0.0922 (0.0367)
SP77I50	0.4862	0.5006					0.4999 (0.0989)								
SP77W50	0.4806	0.5288					0.4967 (0.0994)								
SP77IPR	0.8270	0.6065	0.4069 (0.0611)	0.1135 (0.0170)					-0.1343 (0.0521)						
SP77WPR	0.8358	0.6173	0.4120 (0.0592)	0.1126 (0.0165)					-0.1317 (0.0505)						
C77I50	0.6949	0.4751	0.3936 (0.0706)	0.1248 (0.0211)											
C77W50	0.7062	0.4842	0.4107 (0.0715)	0.1293 (0.0213)											
C77IPR	0.8795	0.5786		0.0529 (0.0169)	0.2460 (0.0514)	-0.2598 (0.1198)	0.2885 (0.0715)			0.3012 (0.0627)		-0.2188 (0.0702)			
C77WPR	0.8706	0.5776	0.3151 (0.0671)	0.0997 (0.0172)	0.2133 (0.0559)	-0.2651 (0.1206)				0.0716 (0.0315)					
SMI75EN	0.7794	1.4606	1.0577 (0.1473)			-1.0171 (0.3106)							-1.2032 (0.3520)		0.7020 (0.3320)

* Regression equation for $X_j = X_i/\bar{X}$

Where: X_j = ratio of individual carrier value (X_i) to the national mean for the viriable ($\bar{X}$)

Standard Deviation (   )

TABLE 4

Adjusted Coefficients of Determination

Dependent Variables	All Carriers n	k	R^2	$\overline{R}^2$	Blue Shield Carriers n	k	R^2	k $\overline{R}^2$	Other Carriers n	k	R^2	$\overline{R}^2$
GP77I50	53	6	0.7412	0.7136	25	2	0.6547	0.6397	28	4	0.7904	0.7642
GP77W50	53	6	0.7464	0.7194	25	2	0.6311	0.6151	28	4	0.7996	0.7745
GP77IPR	53	3	0.6627	0.6489	25	3	0.7213	0.6960	28	5	0.9052	0.8837
GP77WPR	53	3	0.6643	0.6506	25	3	0.7242	0.6991	28	5	0.9032	0.8863
SP77I50	60	3	0.6286	0.6156	31	2	0,6070	0,5934	29	1	0.4862	0.4862
SP77W50	60	3	0.6397	0.6271	31	2	0.5853	0.5710	29	1	0.4806	0.4806
SP77IPR	60	5	0.7417	0.7229	31	4	0.7688	0.7431	29	3	0.8270	0.8136
SP77WPR	60	5	0.7443	0.7257	31	4	0.7513	0.7236	29	3	0.8358	0.8231
C77I50	60	5	0.6848	0.6619	31	2	0.6409	0.6285	29	2	0.6949	0.6836
C77W50	60	5	0.6937	0.6714	31	2	0.6251	0.6121	29	2	0.7062	0.6953
C77IPR	60	3	0.6686	0.6570	31	4	0.7614	0.7348	29	6	0.8795	0.8533
C77WPR	60	4	0.7037	0.6878	31	4	0.7445	0.7161	29	5	0.8706	0.8490
SMI75EN	60	7	0.7733	0.7476	31	2	0.6933	0.6827	29	4	0.7794	0.7518

$\overline{R}^2 = R^2\,[(n-1)-k-1]/n-k$ - adjusted coefficient of determination

where:
n= number of observations
k= number of explanatory variables
R^2= coefficient of determination

TABLE 5

List of Variables

Variable Name	Definition
A. Dependent Variables	
GP77I50	Index of 50th percentile charges, General practitioners, 1977
GP77W50	Weighted* index of 50th percentile charges, GPs, 1977
GP77IPR	Index of prevailing charges, GPs, 1977
GP77WPR	Weighted index of prevailing charges, GPs, 1977
SP77I50	Index of 50th percentile charges, Specialists, 1977
SP77W50	Weighted index of 50th percentile charges, SP, 1977
SP77IPR	Index of prevailing charges, SP, 1977
SP77WPR	Weighted index of prevailing charges, SP, 1977
C77I50	Combined index of 50th percentile charges, GP and SP, 1977
C77W50	Combined weighted index of 50th percentile charges, GP and SP, 1977
C77IPR	Combined index of prevailing charges, GP and SP, 1977
C77WPR	Combined weighted index of prevailing charges, GP and SP, 1977
SMI75EN	Supplementary Medical Insurance expenditure per enrollee, 1975

---

* Frequencies of utilization in 1975 were used as weights in computation of weighted fee indices.

TABLE 5 (Cont.) List of Variables

B. Independent Variables

Variable Name	Definition
PCTURBAN[a]	Percentage of 1970 population in urban areas
MORTAGED[b]	Mortality of aged: total deaths age 65 and over as a percent of population age 65 and over
PCTMDGN[b,c]	Full time MD's and DDS's in general and non-general hospitals per MD (active non-federal physicians, total office and hospital-based)
POPMED[a,c]	Population 1970 per MD (active non-federal physicians, not hospital-based, medical specialties)
POPSUR[a,c]	Population 1970 per MD (active non-federal physicians, not hospital-based, surgical specialties)
POPOMD[a,c]	Population 1970 per MD (active non-federal physicians, other office-based specialties)
HOSPPRO[b]	General and non-general hospitals per internship and residency program
BEDEC[b]	Ratio of total hospital beds to extended care hospital beds
EXPBED[b]	Estimated expense per bed in thousand of dollars
REDBIL[d]	Percent of claims where billed charge was reduced, assigned plus unassigned claims

TABLE 5 (Cont.) List of Variables

Variable Name	Definition
B. Independent Variables (Cont.)	
REDBILU[d]	Same for unassigned claims
RED[d]	Percent by which claims were reduced, based on dollar values, assigned plus unassigned claims
PCDENPR[d]	Denial rate: claims denied as percent of total claims processed
PCINV[d]	Investigation rate: claims investigated as percent of total claims processed
AVSTPDA[d]	Ratio of claims pending to claims processed - assigned claims
AVSTPDU[d]	Same for unassigned claims
AMPTA[d]	Annual mean processing time - assigned claims
AMPTU[d]	Same for unassigned claims
DISPRA16[e]	Carrier practice: pricing sequence in absence of a customary charge
DISPRA17[e]	Carrier practice: pricing sequence in absence of a prevailing charge
DISPRA18[e]	Carrier practice: comparing Medicare customary and/or prevailing charge screens to any other screens

TABLE 5 (Cont.) List of Variables

Variable Name	Definition
B. Independent Variables (Cont.)	
DISPRA19[e]	Carrier practice: pricing of claims by new man in town
DISPRA20[e]	Carrier practice: reimbursement of an established physician with no customary
DISPRACS[e]	Combined score of carrier discretionary practices[f] (sum of practices 1, 2, 5, 6, 8, 9, 11, 13, 14, 15)

---

[a] 1970 Census of Population (included in ARF6MAY77).

[b] Source: ARF6MAY77.

[c] Source: AMA Physician Distribution and Medical Licensure in the U.S. 1975.

[d] Source: Carrier performance report SSA-1565.

[e] Discretionary practices based on responses to IM 75-53 questionnaire.

[f] See list, Table 6.

TABLE 6

LIST OF CARRIER DISCRETIONARY PRACTICES (IM 75-53)

	a/
DISPRA1	AIIa: Data excluded from data base history - Teaching setting claims
DISPRA2	- Provider based physician claims
DISPRA3	- Token and/or extreme charges *
DISPRA4	- Token and/or extreme charges
DISPRA5	- Charges to Medicare ineligibles
DISPRA6	AIIb2: Percent of total data base excluded
DISPRA7	AIIIa: Other data included with Medicare data *
DISPRA8	AIIIa: Other data included with Medicare data
DISPRA9	AIIIb: Other data merged or compared with Medicare data & AIIIc: Percent of data base non-Medicare
DISPRA10	AIIIa: Other data merged or compared with Medicare data & AIIIc: Percent of data base non-Medicare *
DISPRA11	BI: Parameters selected to arrive at a customary charge
DISPRA12	BI: Parameters selected to arrive at a customary charge *
DISPRA13	BIX: Requirement of 3 months base year experience before developing a customary charge profile
DISPRA14	CII: Provider specialty grouping for computing area prevailing charges
DISPRA15	CIII: Minimum number of customary charge records and/or services to compute a prevailing charge
DISPRA16	DIa1: Pricing sequence in absence of a customary charge
DISPRA17	DIa2: Pricing sequence in absence of a prevailing
DISPRA18	DVII: Compare Medicare customary and/or prevailing charge screens to any other screens
DISPRA19	DVIII: Pricing claims submitted by new man in town
DISPRA20	DIX: Reimbursement of an established physician with no customary

---

* Alternative scoring of responses

a/ These numbers refer to sections of IM 75-53 questionnaire.

References

1/ Plus one state government department.

2/ Institute of Medicine of the National Academy of Sciences, Medicare - Medicaid Reimbursement Policies, U.S. Government Printing Office, Washington, D.C., March 1976.

3/ Standard Metropolitan Statistical Area.

4/ Schieber, George J., Burney, Ira L., Colden, Judith B., and Knaus, William A., "Physician Fee Patterns Under Medicare: A Descriptive Analysis", New England Journal of Medicine, May 19, 1976.

5/ Huang, Lien-fu and Koropecky, Orest, "The Effects of the Medicare Method of Reimbursement on Physicians' Fees and on Beneficiaries' Utilization", Volume II, Part 1 of Health Insurance Benefits Advisory Council Report, Robert R. Nathan Associates, July 1973.

6/ The reasonable charge for a service is the lowest of the submitted charge, the customary (the median of a physician's billed fees for a given service), and the prevailing fee for a service, the latter being defined as the 75th percentile of the weighted customaries of charges by physicians in a locality.

7/ Four additional practices were alternative ways of scoring practices among the sixteen.

8/ Denial and investigation rates together with speed of processing are believed to affect providers' willingness to accept assignment. High denial and investigation rates and slow processing of claims would tend to reduce assignment rates, since by accepting assignment, physicians may risk nonpayment, and at best, may expect to have to wait for payment. Our study of the determination of assignment rate is reported elsewhere. 9/

9/ Charlotte F. Muller and Jonah Otelsberg, Study of Physician Reimbursement Under Medicare and Medicaid, Final Report to Health Care Financing Administration pursuant to contract #600-76-0145, December 29, 1978.

10/ Carrier 40, Department of Public Welfare-Oklahoma, was excluded since its jurisdiction overlaps with that of Aetna-Oklahoma.

11/ Not medical or surgical specialist or GP. (Radiologists, psychiatrists, neurologists, and others were in this group.)

12/ Adjusted for hospitals not reporting expenditure but included in bed count.

13/ Discretionary practices represented in factors are as follows: Factor 5 - practices 7, 8, 9, and 10; factor 8 - practices 16 and 20; factor 10 - practices 11 and 12; factor 12 - practice 17; factor 13 - practices 6 and 19; factor 16 - practice 15; and factor 18 - practice 3. See definition of variables (Table 5).

14/ Coefficients of determination adjusted for the number of explanatory variables are shown in Table 4.

References (continued)

15/ Stock of pending claims, a related measure, also entered two equations, for non-Blue carriers only. For assigned claims, an increase in stock relative to claims processed tended to raise fees.

16/ Also, they may feel that their profile will be reduced anyway.

CMS LIBRARY
3 8095 00005776 6